- (1) GENERAL INFORMATION:
- (i) APPLICANT: Houghton, Alan

Bartido, Shirley M.

Xu, Yiquing

Wang, Siqun

(ii) TITLE OF INVENTION: Method and Reagents for Genetic

Immunization

- (iii) NUMBER OF SEQUENCES: 26
- (iv) CORRESPONDENCE ADDRESS:
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- (B) STREET: PO Box 5270
- (C) CITY: Frisco
- (D) STATE: CO
- (E) COUNTRY: USA
- (F) ZIP: 80443-5270
- (v) COMPUTER READABLE FORM:
- (A) MEDIUM TYPE: Diskette, 3.5 inch, 1.44 Mb
- (B) COMPUTER: IBM Compatible
- (C) OPERATING SYSTEM: DOS 5.0
- (D) SOFTWARE: Word Perfect
- (vi) CURRENT APPLICATION DATA:
- (A) APPLICATION NUMBER: PCT/US97/12675
- (B) FILING DATE: 18-JUL-1997
- (C) CLASSIFICATION:
- (vii) PRIOR APPLICATION DATA:
- (A) APPLICATION NUMBER:
- (B) FILING DATE:
- (viii) ATTORNEY/AGENT INFORMATION:
- (A) NAME: Marina T. Larson
- (B) REGISTRATION NUMBER: 32,038
- (C) REFERENCE/DOCKET NUMBER: MSK.P-012
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- (A) TELEPHONE: (970) 668-2050
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- (C) TELEX:
- (2) INFORMATION FOR SEQ ID NO:1:
- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 9
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE:
- (A) DESCRIPTION: peptide
- (iii) HYPOTHETICAL: no
- (v) FRAGMENT TYPE: internal

- (vi) ORIGINAL SOURCE:
- (A) ORGANISM: human
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

Glu Ala Asn Gln Pro Leu Leu Thr Asp

5

- (2) INFORMATION FOR SEQ ID NO:2:
- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 9
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE:
- (A) DESCRIPTION: peptide
- (iii) HYPOTHETICAL: no
- (v) FRAGMENT TYPE: internal
- (vi) ORIGINAL SOURCE:
- (A) ORGANISM: human
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

Glu Glu Lys Gln Pro Leu Leu Met Asp

5

- (2) INFORMATION FOR SEQ ID NO:3:
- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 5
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE:
- (A) DESCRIPTION: peptide
- (iii) HYPOTHETICAL: no
- (v) FRAGMENT TYPE: internal
- (vi) ORIGINAL SOURCE:
- (A) ORGANISM: human
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

Asp Ser Pro Leu Leu

5

- (2) INFORMATION FOR SEQ ID NO:4:
- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 6
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE:
- (A) DESCRIPTION: peptide
- (iii) HYPOTHETICAL: no
- (v) FRAGMENT TYPE: internal

- (vi) ORIGINAL SOURCE:
- (A) ORGANISM: human
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

Glu Asp Thr Pro Leu Leu

5

- (2) INFORMATION FOR SEQ ID NO:5:
- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 12
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE:
- (A) DESCRIPTION: peptide
- (iii) HYPOTHETICAL: no
- (v) FRAGMENT TYPE: internal
- (vi) ORIGINAL SOURCE:
- (A) ORGANISM: human
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

Pro Ser Arg Asp Arg Ser Arg His Asp Lys Ile His

5 10

- (2) INFORMATION FOR SEQ ID NO:6:
- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 9
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE:
- (A) DESCRIPTION: peptide
- (iii) HYPOTHETICAL: no
- (v) FRAGMENT TYPE: internal
- (vi) ORIGINAL SOURCE:
- (A) ORGANISM: human
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

Ser Gly Gly Ser Gly Gly Ser Gly Gly

5

- (2) INFORMATION FOR SEQ ID NO:7:
- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 19
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: genomic DNA
- (iii) HYPOTHETICAL: no
- (iv) ANTI-SENSE: yes

- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:7: CGCCACCAGA CATAATAGC 19
- (2) INFORMATION FOR SEQ ID NO:8:
- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 45
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: genomic DNA
- (iii) HYPOTHETICAL: no
- (iv) ANTI-SENSE: no
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:
- GCCTCCTGAA CCTCCGGAAC CACCAGAAGG GGAAACACAT CTGCC 45
- (2) INFORMATION FOR SEQ ID NO:9:
- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 48
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: genomic DNA
- (iii) HYPOTHETICAL: no
- (iv) ANTI-SENSE: yes
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:
- TCTGGTGGTT CCGGAGGTTC AGGAGGCATC ATTACCATTG CTGTAGTG 48
- (2) INFORMATION FOR SEQ ID NO:10:
- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 22
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: genomic DNA
- (iii) HYPOTHETICAL: no
- (iv) ANTI-SENSE: no
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

GGTTGCTTCG GTACCTGCTG CG 22

- (2) INFORMATION FOR SEQ ID NO:11:
- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 19
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(A) LENGTH: 21

(ii) MOLECULE TYPE: genomic DNA (iii) HYPOTHETICAL: no (iv) ANTI-SENSE: yes (xi) SEQUENCE DESCRIPTION: SEQ ID NO:11: CGCCACCAGA CATAATAGC (2) INFORMATION FOR SEQ ID NO:12: (i) SEQUENCE CHARACTERISTICS: (A) LENGTH: 22 (B) TYPE: nucleic acid (C) STRANDEDNESS: single (D) TOPOLOGY: linear (ii) MOLECULE TYPE: genomic DNA (iii) HYPOTHETICAL: no (iv) ANTI-SENSE: no (xi) SEQUENCE DESCRIPTION: SEQ ID NO:12: GGTTGCTTCG GTACCTGCTG CG 22 (2) INFORMATION FOR SEQ ID NO:13: (i) SEQUENCE CHARACTERISTICS: (A) LENGTH: 42 (B) TYPE: nucleic acid (C) STRANDEDNESS: single (D) TOPOLOGY: linear (ii) MOLECULE TYPE: genomic DNA (iii) HYPOTHETICAL: no (iv) ANTI-SENSE: yes (xi) SEQUENCE DESCRIPTION: SEQ ID NO:13 CTCAGCATAG CGTTGATAGT GATTCTTGGT GCTTCTAGAA CG (2) INFORMATION FOR SEQ ID NO:14: (i) SEQUENCE CHARACTERISTICS: (A) LENGTH: 42 (B) TYPE: nucleic acid (C) STRANDEDNESS: single (D) TOPOLOGY: linear (ii) MOLECULE TYPE: genomic DNA (iii) HYPOTHETICAL: no (iv) ANTI-SENSE: no (xi) SEQUENCE DESCRIPTION: SEQ ID NO:14 CGTTCTAGAA GCACCAAGAA TCACTATCAA CGCTATGCTG AG (2) INFORMATION FOR SEQ ID NO:15: (i) SEQUENCE CHARACTERISTICS:

- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: genomic DNA
- (iii) HYPOTHETICAL: no
- (iv) ANTI-SENSE: yes
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:15
- GAGTGCAGGC TGGTTGGCTT C 21
- (2) INFORMATION FOR SEQ ID NO:16:
- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 21
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: genomic DNA
- (iii) HYPOTHETICAL: no
- (iv) ANTI-SENSE: no
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:16
- CCTGCACTCA CTGATCACTA T 21
- (2) INFORMATION FOR SEQ ID NO:17:
- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 31
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: genomic DNA
- (iii) HYPOTHETICAL: no
- (iv) ANTI-SENSE: no
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:17
- TACTGCTATG GCAATGATAT CAGGTACACT A 3
- (2) INFORMATION FOR SEQ ID NO:18:
- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 30
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: genomic DNA
- (iii) HYPOTHETICAL: no
- (iv) ANTI-SENSE: no
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:18

- (2) INFORMATION FOR SEQ ID NO:19:
- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 31
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: genomic DNA
- (iii) HYPOTHETICAL: no
- (iv) ANTI-SENSE: no
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:19
- GTCTTCGGTT CCTAAGCTTG CAGTAAAGGG T 31
- (2) INFORMATION FOR SEQ ID NO:20:
- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 12
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: other DNA
- (iii) HYPOTHETICAL: no
- (iv) ANTI-SENSE: no
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:20
- CTAGCTAGCT AG 12
- (2) INFORMATION FOR SEQ ID NO:21:
- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 30
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: genomic DNA
- (iii) HYPOTHETICAL: no
- (iv) ANTI-SENSE: no
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:21
- CTGACATGTT CTCTGAAAGA ACCTCAGAGG 30
- (2) INFORMATION FOR SEQ ID NO:22:
- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 30
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: genomic DNA

(iii) HYPOTHETICAL: no (iv) ANTI-SENSE: no	_
(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2: GTGTCCTGAG AACTGATCAT TGCACTGAC	
(2) INFORMATION FOR SEQ ID NO:23: (i) SEQUENCE CHARACTERISTICS: (A) LENGTH: 30 (B) TYPE: nucleic acid (C) STRANDEDNESS: single (D) TOPOLOGY: linear (ii) MOLECULE TYPE: genomic DNA (iii) HYPOTHETICAL: no (iv) ANTI-SENSE: no	
(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2 ATAAACGGAA ATCTGCTCAA ATTGTGGTG	
(2) INFORMATION FOR SEQ ID NO:24: (i) SEQUENCE CHARACTERISTICS: (A) LENGTH: 30 (B) TYPE: nucleic acid (C) STRANDEDNESS: single (D) TOPOLOGY: linear (ii) MOLECULE TYPE: genomic DNA (iii) HYPOTHETICAL: no (iv) ANTI-SENSE: no (xi) SEQUENCE DESCRIPTION: SEQ ID NO:24 ACCCTCAGTG CTCTGACAAA GTGTTCCCA	
(2) INFORMATION FOR SEQ ID NO:25: (i) SEQUENCE CHARACTERISTICS: (A) LENGTH: 30 (B) TYPE: nucleic acid (C) STRANDEDNESS: single (D) TOPOLOGY: linear (ii) MOLECULE TYPE: genomic DNA (iii) HYPOTHETICAL: no (iv) ANTI-SENSE: no	5
(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2. ACTGTCTGTA GACTGGGAAT AAAAAGGAC (2) INFORMATION FOR SEQ ID NO:26:	

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 27

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: genomic DNA

(iii) HYPOTHETICAL: no

(iv) ANTI-SENSE: no

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:26 TCCTCCCGTT CCCTGCAGGA AGAGGTG 27